MULTIMEDIA UNIVERSITY ™

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2021/2022

EME 4216 – QUALITY MANAGEMENT

(ME)

11 AUGUST 2022
9.00 a.m- 11.00 a.m.
(2 Hours)

INSTRUCTION TO STUDENT

1. This question paper consists of 6 pages (including cover page) with 4 questions.
2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the answer booklet provided.

QUESTION 1

(a) Read the following passage and answer the questions:

Ahmad is the envy of his fellow seniors at Multimedia University (MMU). He and his classmates all majored in business or technology disciplines that emphasized quality management. They all hope to begin careers soon as quality professionals, and Ahmad just got a head start. In his very first interview, Ahmad was offered a job as quality manager for an old and well-established electric power company. "I can't believe I got the job!" Ahmad shouted to his classmates. "I spent 10 minutes trying to convince the personnel manager that I could do the job in spite of my lack of experience. When I finally stopped rambling on, he said, 'We want to hire you because you have no experience, not in spite of the fact. We need someone with fresh ideas, someone who is not wedded to the status quo. Frankly, we need to make major changes, and the sooner, the better. You will come in with no loyalties or biases.'" "They are going to expect you to make major culture changes," said one of Ahmad's classmates. "Do you think you're up to it? I remember studying the issue in class. Cultural change comes hard, if it comes at all." "You've got a point there," said Ahmad. "It does concern me. Why is cultural change so hard? I don't know why people can't just get with the program."

(Case study adapted from Goetsch, D.L., and David, S. in Quality Management in Organizational Excellence)

i. Why is it important for Ahmad, as a quality manager, to make major culture changes in his new company?

[3 marks]

ii. In your opinion, why is cultural change so hard?

[8 marks]

iii. Suggest four strategies that can be used by Ahmad to overcome resistance to change in the company.

[8 marks]

(b) Draw a block diagram listing the six-step strategic planning process.

[6 marks]

Continued...

QUESTION 2

(a) A manufacturing company is to make bolts according to the specifications provided by the customer. However, in the past 12 months, the company has begun to produce a lot of defective bolts and rendered the company to a revenue loss of 30%. A consultant hired by the company intends to use the seven quality tools to analyze and solve the problem. Please help the consultant by selecting the best quality tool to accomplish each of the following steps. Explain your choices.

i. The starting point for the consultant is to locate the problem in the process.
ii. Next, the consultant wants to know the possible causes to the problem.
iii. The consultant found out that data was not available for some causes as the company did not track the source of raw materials out of three suppliers. The consultant wants to find out if raw material quality was the cause of fluctuation.
iv. The consultant has a list of causes now and he needs to prioritize the defects and locate the major source of the problem.
v. The consultant then needs a tool that shows him graphically the effect of type of suppliers on the dimeter of the bolts.
vi. The consultant wants to know the correlation between days of inventory and the diameter of the bolt.
vii. The consultant discussed with the CEO on the need of sustaining the improvement initiatives and he has to establish statistical control on two variables: days in inventory and diameter of bolts.

[2 × 7 marks]

(b) The Watson Electric Company produces incandescent lightbulbs. The quality control supervisor in the company has taken five samples with four observations on the number of lumens for 40-watt lightbulbs.The data were collected as shown in Table Q2. With the help of Table A in the Appendix, determine if the process is in control.

Table Q2

Sample	Number of lumens			
	1	2	3	4
1	604	612	588	606
2	596	601	607	603
3	581	568	585	592
4	620	605	570	588
5	590	640	608	604

[11 marks]

Continued...

QUESTION 3

(a) What is Five Why analysis and how it is applied in Toyota's Practical Problem-Solving Process?

[5 marks]

(b) For the scientific approach to problem solving and decision making, complexity means nonproductive or unnecessary work resulting when organizations try to improve processes without first developing a systematic plan. Such nonproductive or unnecessary work is therefore a target of the scientific approach. Explain four types of complexity in scientific approach.

[8 marks]

(c) The decision making process is a logically sequenced series of activities through which decisions are made. Explain each step in it.

[12 marks]

Continued...

QUESTION 4

(a) Taiichi Ohno identified eight categories of waste and these categories have become popular in lean organization. For each case stated below, associate the type of waste enumerated by Taiichi Ohno.

i. Moving material between plants or between work centers and handling more than once
ii. Underuse of talent, skills and creativity of people and the capabilities of the technology
iii. Work performed on the product that adds no value
iv. Unnecessary raw material, finished goods and excess supplies
v. Incorporating unnecessary movement into the production process or into service
vi. Idle time, storage and waiting
vii. Producing more than the customer orders or producing early (before it is demanded)
viii. Returns, warranty claims, rework and scrap

[8 marks]

(b) Explain the following strategies for continual improvement:

i. Jidoka
ii. Just-in-Time (JIT)
iii. Total Productive Maintenance
iv. CEDAC

[12 marks]

(c) The Theory of Constraints (TOC) approaches continual improvement by focusing the attention and effort of the organization to the critical constraint through five steps. What are the five steps?

[5 marks]

End of Paper

APPENDIX

Table A: Factors for Computing Control Chart Limits

Sample size (n)	Factor for $\overline{X}$ chart	Factors for R chart	
	A_2	D_3	D_4
2	1.88	0.00	3.27
3	1.02	0.00	2.57
4	0.73	0.00	2.28
5	0.58	0.00	2.11
6	0.48	0.00	2.00
7	0.42	0.08	1.92
8	0.37	0.14	1.86